depended upon as specific characters. I have named *T. ennius* by comparison with specimens separated in our collection by the author of the species when last in England.

73. THANAOS TRISTIS, *Boisduval, Ann. Soc. Ent. France*, 1852 p. 311. Mendocino County.

Mr. Godman adds the following species:—

74. CARTEROCEPHALUS OMAHA.—Hesperia omaha, *Edwards, Proc. Ent. Soc. Phil.* ii. p. 21 (1863). Siskiyou County.

"Very like our English species."

On Indications of the Sense of Smell in *Actiniæ*. By WALTER HERIES POLLOCK; with an Addendum by GEORGE J. ROMANES, LL.D., F.R.S., Sec. Linn. Soc.

[Read June 15, 1882.]

ABOUT two years ago, when I was staying on the west coast of Scotland, I spent a morning among the rock-pools left by a receding tide. Many of these pools were occupied by specimens of the common Sea-anemone lying in circles; and presently something in the behaviour of these creatures attracted my notice. This was that they appeared to become conscious of the presence of any kind of food (pieces of Mussel, Limpet, &c.) which I placed near them. If this was held near an individual Anemone the creature opened; if it was held in the centre of one of the circles the Anemones gradually opened in succession. Thinking that a burst of sunlight, coinciding with the offer of the bait, might have something to do with this, I repeated the process in pools shaded from the sun, with the same result. Pieces of stick or stone placed in the water (if placed, that is, so as to make a considerable disturbance) seemed to make some slight agitation, which, however, soon subsided; if placed so as to avoid any disturbance they had no visible effect.

I told my friend Mr. Romanes some time afterwards what I had observed. He, I believe, first verified my observations for himself, and then proposed that we should repeat the experiment together. This we did at the Aquarium of the London Zoological Gardens, and afterwards at the Crystal-Palace Aquarium. Mr. Romanes provided for the experiment some morsels of Cockle, which we attached to threads. Some of these morsels we sus-

pended in the water, others we placed on the floor of the tanks. At neither aquarium were the creatures in a lively state; and at the Crystal Palace many of them were sloughing; but the result of many trials convinced us that the Anemones certainly were conscious of the presence of the stuff, the consciousness being shown by gradual opening. The greatest distance from the bait at which we found this consciousness displayed was a span's breadth. In one case which we watched for a considerable time, the Anemone opened somewhat rapidly, and for some time seemed, as we judged from the motions of its tentacles, to be trying to determine in what direction the bait lay, and finally rested with its tentacles spread out in a wrong direction. In another case, that of a large and unhealthy-looking Anemone, the presence of the food seemed to excite repulsion, as some minutes after the bait had been laid down, the creature, which was to begin with and throughout remained half open, had bent itself away from the piece of Cockle which was put within about two inches of it. On the whole, our impression was that the creatures knew that food was near them, but could not distinguish, unless it was quite close to them, in what direction it lay.

Addendum by George J. Romanes, LL.D., F.R.S., Sec. L.S.

As Mr. Pollock has referred to my name in connexion with his paper, I should like to make a few remarks upon the results which his experiments have yielded.

There can be no question at all concerning the truth of the facts; and they apply equally to all the species of *Actiniæ* which we have had the opportunity of observing.

The sense which is thus shown to be presented by these animals may most properly, I think, be called a sense of smell; and they are the lowest animals in which any such sense has hitherto been noticed. It was not found practicable to determine by experiments whether the sense is restricted to any special part of the organism, or is diffused over the whole; for this could only be determined by section, and section has the effect of making Sea-anemones close so firmly, that no inference could be drawn from the fact of their subsequently failing to expand when food was placed in their vicinity.

That their sense of smell does not enable the animals to localize the direction in which the food is lying, is not remarkable; indeed it would only be remarkable were the fact other-

wise. For it is not possible that any animal should be able to ascertain the direction of a source of smell, unless the animal, being freely locomotive, is able, by moving about, to perceive the differential intensity of the olfactory sensation as it approaches or recedes from such a body. But a Sea-anemone, being stationary, has no opportunity of thus distinguishing the direction from which the odour is proceeding; it can only be affected by the odour as this occurs pretty equally diffused around its own organism.

Note on a new Ciliate Infusorian allied to *Pleuronema*.

By Frederick W. Phillips, F.L.S.

[Read June 15, 1882.]

Calyptotricha *, n. gen.

Animalcules *loricate, sedentary*, more or less ovate or pyriform, clothed with flexible, non-vibratile, setose ciliæ. Oral aperture ventral. A vibratory membranous hood or velum. Contractile vesicles and nucleus present, and trichocysts in cortical layer.

Calyptotricha pleuronemoides †, n. sp.

The adult form provided with an elongo-ovate, transparent, hyaline lorica, opening teat-like at both ends. Body-cilia about two thirds the body in length, with shorter, stronger vibratile cilia at entrance of velum; the velum almost equal to the ventral length. Nucleus centrally situate, and two rhythmically contractile vesicles present. Anterior extremity of body protrusible from lorica. Length ·001 inch.

Hab. Pond-water.

The above-named animalcule, which is now described for the first time, was found attached to *Myriophyllum*, obtained from a pond near Hertford. At first sight I thought it was an embryonic or encysted stage of some monad; but upon applying a magnifying-power of some 900 diameters, I observed that it possessed a singular vibratile membrane, closely resembling that which characterizes the members of the family Pleuronemidæ.

I observed that the animalcule was of an ovate form, the body being clothed with numerous long, flexible, but non-vibratile cilia, of a setose character; that the membranous trap, or *velum*, which in form resembled the old-fashioned poke-bonnet, con-

* καλυπτός, veiled or covered; θρίξ, hair.

† Trivial name in allusion to its resemblance to the genus *Pleuronema*.